Get Ready, Get Set, Tessellate!

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According to the National Council of Teachers of Mathematics, the study of concepts and skills in symmetry should be a major component of all contemporary elementary school classrooms (NCTM 2000, 2006). Therefore, I created the following activity that focuses on this very important topic. The objective of this activity is to have the students create and analyze regular tessellations using seven geometric figures. This activity has always generated much mathematical discourse, an important NCTM Standard, between and among the students and the teacher. Students become quite animated when actively discussing "why" certain figures tessellate the plane and others do not.

The Activity

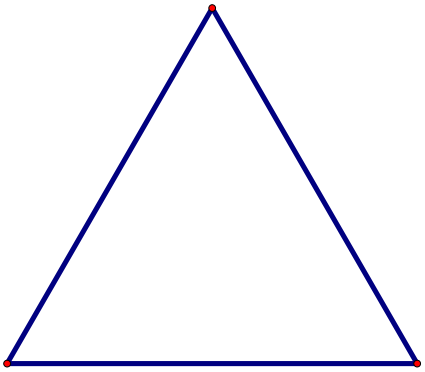
A regular tessellation is a covering of a plane with a one geometric shape so that there are no gaps or overlaps.

- Carefully cut out the models of the regular polygons (see next page*****) or use the supplied pattern pieces. Select the equilateral triangle and try to tessellate the top of your desk/table. Is it possible to do this with no gaps or overlaps? The borders of your desk/table do not matter.

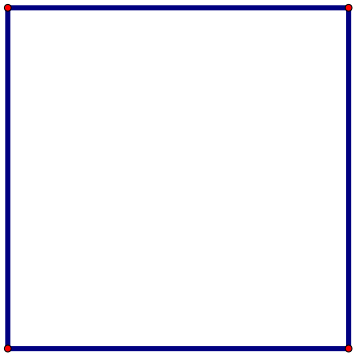
- Try this activity again using the square, pentagon, hexagon, octagon, decagon, and dodecagon. Which of these regular polygons tessellate the plane (your desk/table top)? Which do not?

- Why do you suppose that some of the regular polygons tessellate the plane, but others do not? Discuss this issue within your group. What variables must be considered? Make a conjecture based on your knowledge and group discussion. Be prepared to share your group's conjecture with other groups and the teacher, and be prepared to justify your group's conjecture.

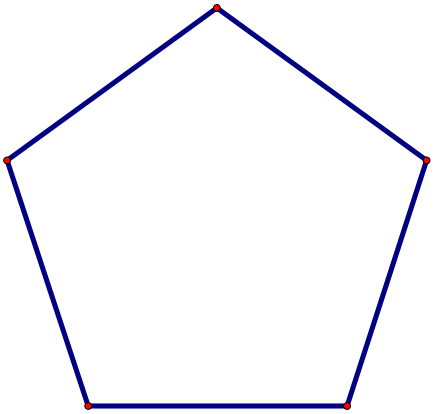
***** Instead of having the students cut out these geometric figures and use them as is; you may wish to cut them out and laminate them ahead of time. This saves time and provides students with an inexpensive and durable set of figures.



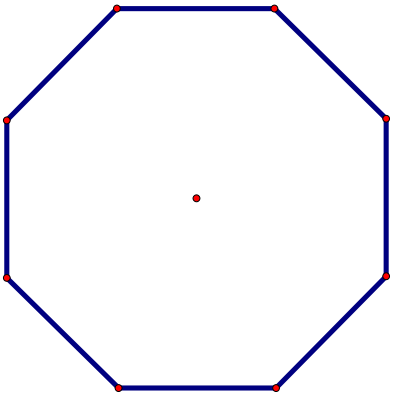
Equilateral Triangle



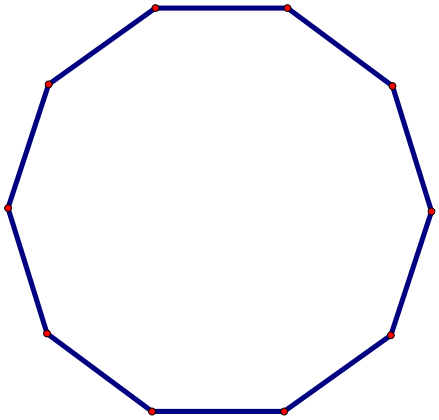
Square



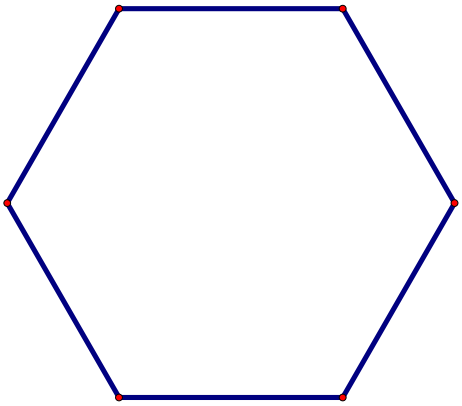
Regular Pentagon



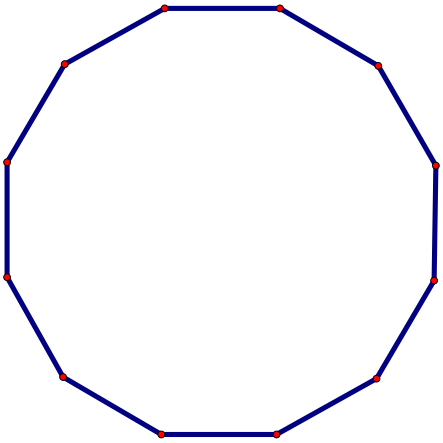
Regular Octagon



Regular Decagon



Regular Hexagon



Regular Dodecagon

References

National Council of Teachers of Mathematics. (2000). *Principles and Standards for School Mathematics*. Reston, VA.

National Council of Teachers of Mathematics. (2006). *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics*. Reston, VA.